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REMARKS

Applicant requests reconsideration of the application in view of the foregoing amendments and the discussion that follows. The status of the claims as of this response is as follows: Claims 30-49 are pending, claims 1-29 having been canceled previously. Claims 40-43 have been withdrawn from consideration. Claims 30 and 44 have been amended herein and claim 31 has been canceled herein.

The Amendment

Claim 30 was amended to provide consistent reference to "said support." Claim 30 was also amended to include a controller for controlling the movement of said mechanism, said controller comprising a computer program that provides for moving said support to and from said station for monomer addition and a flow cell and for moving said support from one flow cell to another flow cell. Support therefor is in the specification, for example, original claim 31, page 24, lines 21-22, and page 25, lines 7-16, and 26-28.

Claim 44 was amended to refer to "said manifold" to provide proper reference back to the first recitation of "a manifold" in the claim. Claim 44 was amended to provide consistent reference to "said support." Claim 44 was also amended to recite that the controller comprises a computer program that provides for moving said support to and from said station for monomer addition and a flow cell and for moving said support from one flow cell to another flow cell. Support therefor is in the specification, for example, original claim 31, page 24, lines 21-22, and page 25, lines 7-16, and 26-28.

Withdrawn Claims

A prior Office Action noted that restriction was required between product and process claims. Applicant acknowledged the indication in the previous Office Action that, where product claims are elected (such as elected above) and a product claim is subsequently found allowable, withdrawn process claims that depend from or otherwise include all the limitations of the allowable product claim will be rejoined in accordance with the provisions of M.P.E.P. §821.04. Method claims 40-43 are dependent from apparatus claim 30 and, thus, fulfill the above requirement with respect to withdrawn process claims.

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Rejection under 35 U.S.C. §112

Claims 44-49 were rejected under the second paragraph of the above code section as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicant submits that the amendment to claim 44 obviates the above ground of rejection.

Rejections under 35 U.S.C. §102/103

Claims 30-31 and 33 were rejected under 35 U.S.C. 102(b) as anticipated by, or in the alternative under 35 U.S.C. 103(a) as obvious over, Blanchard (WO 98/41531). The cancellation of claim 31 renders the rejection of claim 31 moot.

In order to maintain a rejection under 35 U.S.C. §102(b) an examiner must first establish a *prima facie* case of anticipation. An invention is anticipated if each and every limitation of the claimed invention is disclosed in a single prior art reference. *In re Paulsen*, 30 F.3d 1475, 1478, 31 U.S.P.Q.2d 1671, 1673 (Fed. Cir. 1994). It is not enough, however, that the prior art reference discloses all the claimed elements in isolation. Rather, as stated by the Federal Circuit, anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention arranged in the claim. *Lindemann Maschinenfabrik GmbH v. American Holst & Derrick Co.*, 730 F.2d 1452, 221 U.S.P.Q. 481 (Fed. Cir. 1984). In addition, the allegedly anticipating reference must be enabling and describe the claimed invention sufficiently to have placed it in possession of a person of ordinary skill in the art. *In re Paulsen, supra*, at 1673. The anticipation determination is viewed from one of ordinary skill in the art. There must be no difference between the claimed invention and the reference disclosure as viewed by a person of ordinary skill in the field of the invention. *Scrpps Clinic & Research Found. v. Genentech Inc.*, 927 F.2d 1565, 18 U.S.P.Q.2d 1001 (Fed. Cir. 1991).

Without acquiescing in the arguments presented in the Office Action, Applicant submits that Blanchard does not disclose or suggest at least the element of claim 30 directed to a controller for controlling the movement of the mechanism, the controller comprising a computer program that provides for moving the support to and from the station for monomer addition and a flow cell and for moving the support from one flow cell to another flow cell.

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The Office Action contends that Blanchard teaches a controller for controlled movement of the mechanism; the Office Action refers to computer controlled transport arms, page 74, lines 8-31, of Blanchard in support of this contention.

Applicant respectfully traverses this contention. It is clear from the reference that the apparatus of Blanchard at least does not contain a controller that comprises a computer program that provides for moving the support from one flow cell to another flow cell. As indicated in Blanchard at page 74, lines 8-31, which is referred to in the Office Action, the program provides for the geometry of the desired pattern to be deposited on a particular wafer. There is no disclosure or suggestion of a program providing for moving the support to and from the station for monomer addition and a flow cell and for moving the support from one flow cell to another flow cell. Hence, contrary to the assertion in the Office Action in the last sentence of the third paragraph on page 40, Blanchard does not teach all the structural elements required by the claim. As mentioned above, anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention arranged in the claim. *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co., supra*.

The Office Action further asserts that, alternatively, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to provide the transporters of Blanchard with the ability to move a support from one flow cell to the next because the supports, when positioned within the flow cells, are exposed to various solvents and reagents for rinsing, oxidation, deprotection (referring to page 58, lines 1-12, of the reference). It would have been obvious to one of ordinary skill, asserts the Office Action, to dedicate a flow cell for each reagent and provide means for moving supports to and from the different flow cells for reagent-specific treatment. For example, argues the Office Action, if a flow cell was dedicated to providing the rinsing solution, the outlet port could be directly coupled to a waste reservoir while a flow cell that provides a reusable solution, e.g., for oxidation or deprotection, the outlet port could be adapted for recycling of that solution. The Office Action argues that the burden is on applicant to show that the claimed property is either different or non-obvious over that of Blanchard.

Applicant respectfully traverses the above ground of rejection. Applicant submits that Blanchard makes no disclosure or suggestion of employing flow cells in the manner employed in Applicant's invention and, thus, there would be no

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motivation for one skilled in the art to modify the apparatus of Blanchard to include a controller with a program to provide for moving a support from one flow cell to another flow cell. Blanchard discloses nothing more than the known technique of using one flow cell to carry out multiple processing steps. Blanchard (page 58, lines 1-12) states that, after a print head cycle, treating transport 23 is used to move the substrate from the print head assembly to flow cell 30, which "treats" the substrate by exposing it to selective fluids in order to rinse off unconnected monomers, oxidize, and deprotect the substrate. Once rinsed, the substrate is moved again to print head assembly 24 for a further cycle of monomer deposits and then rinsed again in the flow cell. The steps are repeated numerous times to build desired biopolymer sequences. Accordingly, Blanchard discloses nothing more than conducting the processing steps in one flow cell.

Applicant submits that the argument and conclusion in the Office Action is contrary to the teachings of the reference and is the result of hindsight reconstruction of the prior art based on Applicant's disclosure.

In the paragraph bridging pages 74 and 75, Blanchard discloses an automated synthesis system where there are multiple flow cells. It is clear from this disclosure that each flow cell is employed to conduct multiple processing steps consistent with the teaching at page 58 above. At the top of page 75, Blanchard states that each flow cell is checked to see whether it is done with treating the wafer. If the treatment is done, the wafer is transferred to scanning arm 44. Applicant submits that, if each flow cell did not perform multiple processing steps, then the wafer would not be transferred to the scanning arm. Rather, Fig. 14 of Blanchard would show one wafer moving between several flow cells before moving to the scanning arm. Otherwise, the substrate would not be fully processed before the next monomer deposit is made. Blanchard's disclosure of a system with multiple flow cells relates only to multi-tasking, that is, concomitantly synthesizing arrays on the surface of several substrates using a separate flow cell for each substrate. Blanchard makes no disclosure or suggestion to modify the teaching of the reference in the manner in which the Examiner has done.

The Federal Circuit has held that the mere fact that the prior art may be modified in the manner suggested by an examiner does not make the modification obvious unless the prior art suggested the desirability of the modification (*In re Fine*, 837 F. 2d 1071, 5 USPQ 2d 1596 (Fed. Cir. 1988)). In the present situation there is

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no teaching or suggestion in Blanchard to use a single flow cell for anything other than conducting several processing steps such as rinsing, oxidizing and deprotecting. It is impermissible to use the claimed invention as an instruction manual or template to piece together the teachings of the prior art so that the claimed invention is rendered obvious. *In re Fritch*, 972 F. 2d 1260, 23 USPQ 2d 1780 (Fed. Cir. 1992), quoting *In re Fine*, *supra*.

For the reasons given above, the Examiner has not established a *prima facie* case of obviousness. Accordingly, the burden is not on Applicant to show that the claimed controller with a program for providing for placing the support into "another" flow cell is either different or non-obvious over that of Blanchard.

Claim 33 depends from claim 30, which is patentable over Blanchard as demonstrated above. Claim 33 is, therefore, patentable over Blanchard by virtue of such dependency. If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) (M.P.E.P. 2143.03).

Rejections under 35 U.S.C. §103

Claims 34 and 39 were rejected under 35 U.S.C. 103(a) as being unpatentable over Blanchard in view of Goldberg, *et al.* (U.S. Patent No. 5,959,098) (Goldberg).

Regarding Claims 34 and 39, the Office Action reiterates its arguments regarding the disclosure of Blanchard as it pertains to claim 30. The Office Action recognizes that the teaching of Blanchard does not disclose a manifold in fluidic communication with the flow cell. However, asserts the Office Action, manifold communication with flow cells for delivery of different reagents for biopolymer synthesis was well known and routinely practiced in the art at the time the claimed invention was made as taught by Goldberg. It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made, asserts the Office Action, to apply the manifold supplying differential reagent delivery taught by Goldberg to the apparatus of Blanchard. The Office Action contends that one of ordinary skill in the art would have been motivated to do so for the expected benefit of batch processing and efficiency advantages taught by Goldberg (referring to column 24, lines 10-14).

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Without acquiescing in the arguments in the Office Action, Applicant submits that Blanchard is deficient as demonstrated above in not disclosing or suggesting the apparatus of claim 30. Claims 34 and 39 depend ultimately from claim 30 and are, therefore, patentable over the combined teachings of Blanchard and Goldberg. Furthermore, in the sentence immediately following the above passage in Goldberg, the patentee indicates that the photolysis step may be conducted outside a flow cell. Such a teaching may be argued to negative motivation for combining the teachings of the references.

Claim 32 was rejected under 35 U.S.C. 103(a) as being unpatentable over Blanchard in view of Hillman, *et al.* (U.S. Patent No. 4,856,456) (Hillman).

Regarding claim 32, the Office Action reiterates its arguments regarding the disclosure of Blanchard as it pertains to claim 30. The Office Action recognizes that Blanchard is silent regarding finger-like projections on the vacuum chuck. However, contends the Office Action, vacuum chucks having finger-like projections were well known in the art of substrate processing as taught by Hillman.

Without acquiescing in the arguments in the Office Action, Applicant submits that Blanchard is deficient as demonstrated above in not disclosing or suggesting the apparatus of claim 30. Claim 32 depends ultimately from claim 30 and is, therefore, patentable over the combined teachings of Blanchard and Hillman.

Claims 35-38 were rejected under 35 U.S.C. 103(a) as being unpatentable over Blanchard in view of Nokihara (U.S. Patent No. 5,362,447).

Regarding claims 35-38, the Office Action reiterates its arguments regarding the disclosure of Blanchard as it pertains to claim 30. The Office Action recognizes that Blanchard does not teach a purification system in communication with the outlet. However, asserts the Office Action, automated synthesizers having column purification systems and sensors attached to flow cell outlets were well known in the art at the time the claimed invention was made as taught by Nokihara.

Without acquiescing in the arguments in the Office Action, Applicant submits that Blanchard is deficient as demonstrated above in not disclosing or suggesting the apparatus of claim 30. Claims 35-38 depend ultimately from claim 30 and are, therefore, patentable over the combined teachings of Blanchard and Nokihara by virtue of such dependency. As mentioned above, if an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is

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nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) (M.P.E.P. 2143.03).

Claim 38 was rejected under 35 U.S.C. 103(a) as being unpatentable over Blanchard in view of Kedar (U.S. Patent No. 6,165,778).

Regarding claim 38, the Office Action reiterates its arguments regarding the disclosure of Blanchard as it pertains to claim 30. The Office Action recognizes that Blanchard is silent regarding a sensor in fluid communication with an outlet. However, argues the Office Action, Kedar teaches an apparatus for array synthesis wherein the apparatus comprises a sensor in fluid communication with the outlet (referring to #111S-119S, column 74, lines 46-56 and column 77, lines 35-46, of Kedar) wherein the sensor determines a condition of the reagents and communicates with a controller, which also communicates with the valves.

Kedar does not disclose or suggest an apparatus as claimed in claim 38, which recites that the sensor determines the condition of a fluid reagent and, based on such determination, communicates with a valve to direct at least a portion or all of the fluid reagent to the inlet of a flow cell to be combined with fresh fluid reagent or sent to waste. The sensor in Kedar merely senses a level of liquid. According to M.P.E.P. 2143.03, all claim limitations must be taught or suggested by the prior art in order to establish prima facie obviousness (citing *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)). Therefore, the combined teachings of Blanchard and Kedar do not result in the apparatus as claimed in claim 38.

Furthermore, without acquiescing in the arguments in the Office Action, Applicant submits that Blanchard is deficient as demonstrated above in not disclosing or suggesting the apparatus of claim 30. Claim 38 depends ultimately from claim 30 and is, therefore, patentable over the combined teachings of Blanchard and Kedar by virtue of such dependency.

Claims 44 and 46-49 were rejected under 35 U.S.C. 103(a) as being unpatentable over Blanchard in view of Goldberg and Nokihara.

The Office Action reiterates its arguments regarding the disclosure of Blanchard as it pertains to claim 30. The Office Action recognizes that the teaching of Blanchard does not disclose a manifold in fluidic communication with the flow cell. However, asserts the Office Action, manifold communication with flow cells for delivery of different reagents for biopolymer synthesis was well known and routinely practiced in the art at the time the claimed invention was made as taught by

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Goldberg. It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made, asserts the Office Action, to apply the manifold supplying differential reagent delivery taught by Goldberg to the apparatus of Blanchard. The Office Action contends that one of ordinary skill in the art would have been motivated to do so for the expected benefit of batch processing and efficiency advantages taught by Goldberg (referring to column 24, lines 10-14).

The Office Action recognizes that the combined teachings of Blanchard and Goldberg do not teach a purification system in communication with the outlet. However, asserts the Office Action, automated synthesizers having column purification systems and sensors attached to flow cell outlets were well known in the art at the time the claimed invention was made as taught by Nokihara.

Without acquiescing in the arguments presented in the Office Action, Applicant submits that Blanchard is deficient in not disclosing or suggesting at least the element of claim 44 directed to a controller for controlling the movement of the mechanism, the controller comprising a computer program that provides for moving the support to and from the station for monomer addition and a flow cell and for moving the support from one flow cell to another flow cell. Neither Goldberg nor Nokihara cures the above deficiency. According to M.P.E.P. 2143.03, all claim limitations must be taught or suggested by the prior art in order to establish prima facie obviousness (citing *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)).

Claim 45 was rejected under 35 U.S.C. 103(a) as being unpatentable over Blanchard in view of Goldberg and Nokihara as applied to claim 44 above and further in view of Hillman.

Regarding claim 45, the Office Action reiterates its arguments regarding the disclosure of Blanchard as it pertains to claim 44. The Office Action recognizes that Blanchard is silent regarding finger-like projections on the vacuum chuck. However, contends the Office Action, vacuum chucks having finger-like projections were well known in the art of substrate processing as taught by Hillman.

Without acquiescing in the arguments in the Office Action, Applicant submits that the combined teaching of Blanchard, Goldberg and Nokihara is deficient as demonstrated above in not disclosing or suggesting the apparatus of claim 44. Claim 45 depends ultimately from claim 44 and is, therefore, patentable over the combined teachings of Blanchard, Goldberg, Nokihara and Hillman. None of the secondary references cures the deficiency of Blanchard in not disclosing or suggesting at least

the element of claim 44 directed to a controller for controlling the movement of the mechanism, the controller comprising a computer program that provides for moving the support to and from the station for monomer addition and a flow cell and for moving the support from one flow cell to another flow cell.

Provisional Obviousness-type Double Patenting Rejection

Claims 30-31, 33-34 and 39 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 23-28 of copending Application No. 10/172,470 (the '470 application). Although the conflicting claims are not identical, asserts the Office Action, they are not patentably distinct from each other because both sets of claims are drawn to flow cell devices comprising a flow cell housing a substrate, a fluid dispensing manifold, stations for reagent delivery and mechanical means for moving the support. The claim sets merely differ in that the '470 claims are further drawn to a vacuum source. However, the instant claim language "comprising" encompasses the additional element of the '470 claims.

As indicated in M.P.E.P. section 804, a double patenting rejection of the obviousness-type is "analogous to [a failure to meet] the nonobviousness requirement of 35 U.S.C. 103 except that the patent principally underlying the double patenting rejection is not considered prior art. *In re Braithwaite*, 379 F.2d 594, 154 USPQ 29 (CCPA 1967). Therefore, any analysis employed in an obviousness-type double patenting rejection parallels the guidelines for analysis of a 35 U.S.C. 103 obviousness determination. *In re Braat*, 937 F.2d 589, 19 USPQ2d 1289 (Fed. Cir. 1991); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985).

Applicant respectfully traverses the above rejection. Claim 23 of the '170 application, for example, is currently directed to a flow cell assembly for conducting at least one reaction in the synthesis of an array of biopolymers on the surface of a support. The flow cell comprises: (a) a flow cell chamber, (b) a manifold in fluid communication with said chamber, said manifold comprising at least a separate wash reagent inlet in fluid communication with a dispensing station for said wash reagent, a separate inlet for a reagent for conducting a step of said synthesis in fluid communication with a dispensing station for said reagent, and a separate vent, (c) a vacuum source in fluid communication with said flow cell chamber, and (d) a controller communicating with a computer comprising software to control said vent

and said vacuum source to simultaneously vent and apply vacuum to the flow chamber.

On the other hand, claim 30, for example, of the present application is directed to an apparatus for synthesizing an array of biopolymers on the surface of a support. The apparatus comprises: (a) a plurality of flow cells, wherein each of the flow cells comprises a chamber and a holder for said support in said chamber and wherein said support is a strip, a plate or flat glass and wherein said array comprises a plurality of biopolymer features arranged in a pattern on a surface of the support, (b) one or more fluid dispensing stations in fluid communication with one or more of said plurality of flow cells, (c) a station for monomer addition to said surface of said support, (d) a mechanism for moving a support to and from said station for monomer addition and a flow cell and for moving said support from one flow cell to another flow cell, wherein said mechanism comprises a robotic arm and a holding element for engaging said support and wherein said holding element comprises a vacuum-activated fork or grasping elements, and (e) a controller for controlling the movement of said mechanism, said controller comprising a computer program that provides for moving said support to and from said station for monomer addition and a flow cell and for moving said support from one flow cell to another flow cell.

Without acquiescing in the above rejection, Applicant submits that claims 23-28 of '170 application, at the very least, fail to suggest a controller for controlling the movement of the mechanism, the controller comprising a computer program that provides for moving the support to and from the station for monomer addition and a flow cell and for moving the support from one flow cell to another flow cell as claimed in instant claim 30. In addition, the claims of the '170 application are not suggestive of the apparatus of the instant claims merely because the instant claims use "comprising" terminology.

Furthermore, the rejection over the '170 application is a provisional obviousness-type double patenting rejection because the conflicting claims of the '170 application have not in fact been patented. Accordingly, this provisional rejection can only be effective at the issuance of a patent for the '170 application. Applicant will review his options with regard to a terminal disclaimer and the like at the time of an indication of allowance in the '170 application or in the present application.

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Conclusion

Claims 30, 32-39 and 44-49 satisfy the requirements of 35 U.S.C. §§112, 102, 102/103 and 103 and do not circumscribe the judicially created doctrine of obviousness-type double patenting. Allowance of the above-identified patent application, it is submitted, is in order.

Respectfully submitted,



Theodore J. Lettereg
Attorney for Applicant
Reg. No. 28,319

Agilent Technologies, Inc.
Legal Department, M/S DL429
Intellectual Property Administration
P.O. Box 7599
Loveland, CO 80537-0599